REMARKS

Claims 1-9 are pending and rejected under 35 U.S.C. 102 as being allegedly anticipated by Yamasaki et al. (US 6,357,753; hereafter "Yamasaki"). Applicant traverses the rejection because Yamasaki fails to disclose, teach or suggest all the features recited in the rejected claims. For example, Yamasaki fails to disclose, teach or suggest the claimed arrangement, wherein "at least one of the first additional parts arranged to transfer the rotation torque of at least one of the shaft and the second additional part receiving torque is a super elastic memory metal element arranged to bend within the limits of the reversible deformation of the material," as recited in independent claim 1 and its dependent claims 2-9.

- **Yamasaki Fails to Teach or Suggest Claimed Additional Parts Made of Super Elastic Memory Metal**

As explained previously, Yamasaki's cylindrical holder 21 (allegedly corresponding to the claimed second additional part) and rear end portion 40 (allegedly corresponding to the claimed first additional part) are disclosed as being made of titanium; however, Yamasaki fails to teach or suggest that those parts, or their material (titanium), may or should have super elastic memory metal characteristics. Furthermore, Yamasaki fails to teach or suggest that the cylindrical holder 21 or the rear end portion 30 are arranged to transfer torque of the rotating parts in the mechanical shaft seal. In fact, the selection of titanium for components 21 and 40 in Yamasaki would be understood by one of ordinary skill in the art as a selection based on the good strength characteristics of titanium. However, Yamasaki fails to teach or suggest any motivation for modifying the material of these components to be a super elastic memory metal.

In response to these arguments, the Office Action has now asserted that these arguments are not persuasive because the Office Action has concluded that Yamasaki's "metal members are super elastic memory metal elements (e.g., titanium or allows or stainless steel). Furthermore, it is noted that applicant has not defined any particular material in the specification that is a super elastic memory metal element."

In response, Applicant submits that the term "super elastic memory metal" is a term of art understood by one of ordinary skill in the art to be an alloy rather than a pure metal. Such a term of art is known in the prior art as evidenced by attached patent applications, WO 2004/098450 and US 2003/0196298, which pertain to different kinds of products made at least partly from "super-elastic memory metal." Both references disclose the well-known properties of a super-

elastic materials and clearly define that one such metal is the metal alloy nitinol (NiTi). Further, the references clearly evidence that super-elastic memory metals are produced from metal alloys, not from pure metals, such as titanium. Nitinol is one preferred alloy, but it is only one example of super-elastic memory metals.

Such memory metals provide super elasticity of the material, which can provide a much larger reversible deformation compared with other common metals when the metal is placed under the influence of torque.

Therefore, according to the claimed invention, various parts of the mechanical shaft seal are formed from super elastic memory metal elements and are arranged to bend within the limits of the reversible deformation of that material. The additional parts of a mechanical shaft seal transferring torque from the shaft of the device are formed as super-elastic memory metal elements. However, the kind of material that is used for providing the other parts of the mechanical shaft seal is not relevant to the patentability of the claimed invention over Yamasaki.

As explained previously in Applicant's specification, the problem with prior art mechanical shaft seals is that the additional parts transferring torque from the shaft of the device and/or additional parts receiving the torque included in the shaft seal are subjected to wear or are broken at the points, from which torque is transferred from one part to another, for instance to the sliding surface parts. The same problem occurs with the parts intended to be non-rotating at points, from which the non-rotating parts are locked to the device or to a separate frame part. The torque caused by frictional force formed between the plane surfaces of the non-rotating parts and the rotating parts in the mechanical shaft seal wears and breaks the additional parts that serve to transfer the rotating motion of the device shaft to the rotating parts of the mechanical seal, or which tend to be used for preventing the rotating motion produced by the torque caused by the frictional force in the non-rotating parts of the mechanical shaft seal.

This phenomenon causes the mechanical shaft seal to be prematurely damaged in such a manner that the mechanical seal no longer operates as planned for sealing the gap between the rotating shaft and the static parts of the device. Additionally, the torque causes the sliding surfaces of the sliding surface parts in the mechanical seal to deform so that the mechanical seal no longer operates as intended.

- **Yamasaki Fails to Teach or Suggest Claimed First Additional Parts Arranged to Transfer the Rotation Torque**

Moreover, in Yamasaki's mechanical seal, the additional parts and drive pins transferring the torque from the shaft of the device and the additional parts receiving the torque are denoted as 45 and 24 (see col. 5, lines 20 to 63 and col. 6, lines 47 to 65, respectively). However, Yamasaki fails to teach or suggest the material of which the drive pins are made. The cylindrical holder 21 houses an annular seal ring element 22 having the sliding seal surface 25. The seal surface 25 is pressed against the rotary seal ring 35. Thus, the holder 21 does not transfer or receive torque. Furthermore, Yamasaki teaches that the holder 21 may be made of pure titanium, which is not a super-elastic or memory metal as explained above. In fact, Yamasaki fails to teach or suggest the use of super-elastic memory metals in any way. Therefore the present invention is novel over this document.

Thus, Yamasaki fails to disclose, teach or suggest the claimed arrangement, wherein "at least one of the first additional part arranged to transfer the rotation torque of at least one of the shaft and the second additional part receiving torque is a super elastic memory metal element arranged to bend within the limits of the reversible deformation of the material," as recited in independent claim 1 and its dependent claims 2-9.

Therefore, claims 1-9 are patentable over Yamasaki and the rejection must be withdrawn.

For all of the above reasons, withdrawal of the rejection of the pending claims is respectfully requested. In view of the above, it is submitted that all of the pending claims are in condition for allowance and such action is respectfully requested. If there is any issue remaining to be resolved, the examiner is invited to telephone the undersigned at (202) 371-6371 so that resolution can be promptly effected.

It is requested that, if necessary to effect a timely response, this paper be considered a Petition for an Extension of Time sufficient to effect a timely response with the fee for such extensions and shortages in other fees, being charged, or any overpayment in fees being credited, to the Account of Barnes & Thornburg LLP, Deposit Account No. **10-0435** (44655-356508).

Respectfully submitted,

BARNES & THORNBURG LLP

/ Christine H. McCarthy /

Christine H. McCarthy
Reg. No. 41,844
Tel. No. (202) 371-6371

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